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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/554,415	10/24/2005	Thomas Sugar	09049-00004-US1	5350
30678 7590 06/17/2009 CONNOLLY BOVE LODGE & HUTZ LLP 1875 EYE STREET, N.W. SUITE 1100 WASHINGTON, DC 20006				
EXAMINER				
MATTER, KRISTIN CLARETTE				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/554,415

Applicant(s)

SUGAR ET AL.

Examiner

KRISTEN C. MATTER

Art Unit

3771

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10/24/05.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 October 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/CDC)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

Priority

Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(c) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged. Examiner notes that the PCT listed on the Oath is incorrect. However, the correct PCT number is listed on the Application Data Sheet, which is controlling for determining priority.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the clamping device(s), bladder, braided material, pneumatic source, and shell member(s) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "28" has been used to designate both header section and access opening (page 4), reference character "30" has been used to designate both mechanical connector and fitting (page 4), and reference character "130" as been used to designate both hooks and apparently a person (Figure 5).

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 32.

The drawings are also objected to because the shading (particularly in Figures 5-13) makes it difficult to see the details of the drawings and should be removed.

Additionally, Figure 13 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Applicant acknowledges that this Figure is a device of Nakamura et al. in paragraph 67. Examiner also points out that there are no reference characters in the drawing that are described in the written specification and it is unclear how the various elements in Figure 13 are related and what they represent because it is not clearly explained in the written specification or clearly shown by the drawing itself.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code (paragraph 67). Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See MPEP § 608.01.

The disclosure is also objected to because of the following informalities: the graphs on page 6 and 8 should be moved to the drawings section because graphical illustrations, diagrammatic views, flowcharts, and diagrams in the descriptive portion of the specification do not come within the purview of 37 CFR 1.58(a).

Appropriate correction is required.

Claim Objections

Claim 20 is objected to because of the following informalities: in line 2, “each of the muscle actuator is” should be changed to --each of the muscle actuators are-- to correct the typographical mistake.

Claim 23 is objected to because of the following informalities: in line 3, “positioned” should be changed to --position-- to correct the typographical mistake.

Claim 31 is objected to because of the following informalities: in line 2, “actuator” should be changed to --actuators-- to correct the typographical mistake.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-32 and 35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 includes the limitation "an end fitting attached to both the first end and the second end" in lines 3-4. This language is somewhat confusing because from a reading of the claim it is unclear if the same end fitting attached to both the ends or if one end fitting is attached to each end, the latter being supported by the specification. Examiner suggests changing "both" to --each of-- to better clarify the structure.

Claims 10, 15, and 17, recite that the mechanical device is mounted "in parallel," "over," or "adjacent" the muscle actuator. This language is somewhat confusing because from claim 10 it appears that the mechanical device is part of/included in the muscle actuator, making it unclear how the mechanical device could also then be mounted as a distinct element that is parallel to, over, or adjacent the muscle actuator at the same time as being part of it.

Regarding claims 12, 13, and 35, the phrase "-type" renders the claim(s) indefinite because it is unclear if the shock absorber must actually be a compression gas spring shock absorber or just something that has the same function, structure, etc.

Claim 19, in line 2, recites "spaced apart from one another." It is somewhat unclear what the "one another" is referring to. Applicant is encouraged to replace "one another" with the name of the claimed element being referred to.

Claims 25, 27, 29, and 31 all refer to "the muscle actuator" in addition to second (or third or forth) muscle actuators. It is somewhat confusing which actuator "the muscle actuator" is

referring to when there is more than one with the current wording. Examiner suggests changing claim 10 to read "A device comprising a first muscle actuator comprising..." and consistently referring to all muscle actuators as the first, second, third, or forth actuator as needed (note that many of the dependent claims would subsequently need amended as well to provide appropriate antecedent basis or to refer to "The device of claim #").

Claims 2-9 are dependent on claim 1 and are therefore rejected for the reasons outlined above with respect to claim 1.

Claims 11, 14, 16, 18, 20-24, 26, 28, and 30 are dependent on a rejected claim base and are therefore rejected for the reasons outlined above with respect to claim 10.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7, 10, 14, 15, 17-19, 21, 22, 24, 33, and 36, as best understood by the examiner, are rejected under 35 U.S.C. 102(b) as being anticipated by Negishi et al. (US 5,158,005, herein referred to as "Negishi").

Regarding claims 1, 10, 14, 33, and 36, Negishi discloses a muscle actuator comprising an inner bladder (12) comprising a first end and a second end (see Figure 1) and the inner bladder being configured to communicate with a pneumatic source (column 2, lines 25-35), a braided material (14) wrapped over at least a substantial portion of the inner bladder (see Figure

1), an end fitting (16) attached to both the first end and the second end, and a helical spring (28) positioned over at least a portion of the braided material (see Figure 3b). When pressurized fluid is introduced into a passage (24) in the bladder, the actuator expands axially compressing the coil spring (column 2, lines 30-35 and Figure 3a) and when the pressurized fluid is exhausted from the bladder the spring generates a pushing force (column 4, lines 40-45).

Regarding claim 2, the muscle actuator of Negishi would inherently have a control mechanism (i.e., a valve for example) for controlling the amount of flow of a pneumatic source into and out of the inner bladder otherwise pressurized fluid would not be able to be supplied to the bladder as required by Negishi to operate the device.

Regarding claims 3 and 15, the spring of Negishi is mounted over at least a portion of the braided material (see Figure 3b), and since the spring appears to lie over top all other layers it can be considered as being mounted over the muscle actuator.

Regarding claims 4-7, 18, 21, and 22, Negishi further discloses two telescoping tubular shell members (22) positioned over at least a portion of the braided material and a clamping device attached to each end of the spring (column 4, lines 45-55).

Regarding claim 17, as seen in Figure 3a, the spring is mounted adjacent the muscle actuator.

Regarding claim 19, Negishi discloses a plurality of muscle actuators mounted in parallel to each other (column 5, lines 8-11). Since each actuator is a separate device they would inherently be spaced from one another.

Regarding claim 24, the spring of Negishi is clamped in a stretched position so that it is compressed when the telescoping members expand (see Figure 3a). Upon removal of the force

created by the pneumatic source, the compressed spring exerts a force that more quickly returns the telescoping portions to their original position (column 4, lines 35-45).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 11-13, 34, and 35, as best understood by the examiner, are rejected under 35 U.S.C. 103(a) as being unpatentable over Negishi.

Regarding claims 11-13, 34, and 35, Negishi discloses an elastic member for providing quicker return of the extensible member to its original length and gives a coil spring as an example (column 4, lines 40-50). Negishi does not specifically disclose a shock absorber. However, shock absorbers are well known and commonly used for quick return of extensible members (see cited art and also applicant's specification paragraph 58 in which shock absorbers are discussed as being prior art devices). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have replaced the spring of Negishi with a shock absorber in order to provide a well known and commonly used means for quickly returning the extensible member to its original length and to allow more accurate control over the speed of return. Furthermore, there is nothing structurally that would prevent such a modification and it appears that the device of Negishi would perform equally well with a shock absorber (or any other elastic means capable of quickly returning the member to its original length). The specific type of shock absorber (i.e., locking compression gas spring-type) is considered an obvious design consideration to one of ordinary skill in the art depending on the specific application the actuator is being used for and the needed control with extension and compression of the device.

Claims 8 and 9, as best understood by the examiner, are rejected under 35 U.S.C. 103(a) as being unpatentable over Negishi as applied to claim 1 above, and further in view of Brook et al. (US 4,875,469).

Regarding claim 8, Negishi does not disclose an elongated shell positioned over the spring. However, Brook et al. discloses a muscle actuating device with an elongated shell mounted over a spring (see Figure 5). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have positioned a shell over the spring as taught by Brook et al. in the device of Negishi in order to minimize the risk of a user getting pinched by the spring when it is compressed for example. Furthermore, it appears as though the device of Negishi would perform equally well with a shell positioned over the spring so long as the spring could still be compressed and expanded because there is nothing structurally from preventing the addition of another shell and it is well known and common practice to place a shell over a spring to protect both the spring and a user.

Regarding claim 9, the annular projection (see Figure 3b) where the spring is attached to the shell can be considered a disc comprising an opening that is mechanically coupled to one end of the spring.

Claim 16, as best understood by the examiner, is rejected under 35 U.S.C. 103(a) as being unpatentable over Negishi as applied to claims 10 and 14 above, and further in view of Chiel et al. (US 2003/0065250).

Regarding claim 16, Negishi does not disclose the spring as being mounted inside the inner bladder. However, Chiel et al. discloses an expandable actuator with a spring mounted into the bladder to restore the bladder to its original shape (abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have moved the spring of Negishi to inside the bladder as taught by Chiel et al. in order to reduce the overall

dimensions of the actuator or to prevent a user from getting pinched by the spring for example. Furthermore, there is nothing structurally preventing the spring from being mounted inside the bladder and it appears as though the device of Negishi would perform equally well with the spring mounted inside the bladder.

Claims 20, and 25-28, as best understood by the examiner, are rejected under 35 U.S.C. 103(a) as being unpatentable over Negishi as applied to claims 10, 19, and 29 above, and further in view of Barclay (US 3,976,057).

Regarding claim 20 and 25-28, Negishi is silent as to the muscle actuator specifically being used with a knee brace having a pivoting member. However, Barclay discloses a knee brace with pneumatic actuators mechanically coupled to the brace for providing flexion and extension of the knee. Barclay further discloses the two actuators as mounted in parallel on different sides of a pivot arm (18, 19) having a pivot joint (22) of the knee brace. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the actuators of Negishi with a pivoting knee brace as taught by Barclay because it would have allowed a user to quickly extend and flex their knee as needed with the assistance of a pneumatic actuator. Furthermore, it appears that the device of Negishi would perform equally well if used to assist movement of any hinge joint by being coupled to a brace surrounding that joint.

Claims 23 and 29-32, as best understood by the examiner, are rejected under 35 U.S.C. 103(a) as being unpatentable over Negishi as applied to claims 10 and 22 above, and further in view of Coffey (US 1,928,368).

Regarding claim 23, Negishi is silent as to the spring being clamped in a compressed position when the actuator is in a starting position. However, Coffey discloses an expandable/contractible bladder with a spring clamped in a compressed position to start (see Figure 3; since a jack raises a car it appears that the spring is compressed to start). When the pneumatic force is removed, the spring pulls the actuator back to its original dimension. Therefore, absent a critical teaching and/or showing of unexpected results from having the spring clamped in a stretched or compressed position to start, examiner contends that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have clamped the spring in either a compressed or stretched position to start depending on the particular application the actuator is being used for. Furthermore, it appears as though the device of Negishi would perform equally well with the spring being clamped in a compressed position to start so long as the spring was able to exert enough force to help restore the actuator to its starting length.

Regarding claims 29, 31, and 32, depending on the application of the device the number of devices being used and the use of pivoting joints is considered an obvious design consideration to one of ordinary skill in the art (for example, using the actuators for movement of two hinge joints on a hand would require several pivoting members and muscle actuators). However, Negishi does not disclose the actuator having a mechanical device(s) mounted in parallel with the actuator. Coffey discloses an expandable/contractible bladder with a plurality of

springs (28) mounted in parallel to telescoping portions (see Figure 2 and page 2, lines 55-60). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have mounted one or more springs in the Negishi device in parallel with the actuator as taught by Coffey depending on the application of the device and to provide equal distribution of the restorative force.

Regarding claim 30, Coffey discloses the spring attached to flanges (see Figure 5). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have attached the mechanical devices of Negishi to flanges as taught by Coffey because it would have provided some space between the bladder and spring or between the actuators and a limb so as to avoid interference with the operation of the actuators.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KRISTEN C. MATTER whose telephone number is (571)272-5270. The examiner can normally be reached on Monday - Friday 9-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Justine Yu can be reached on (571) 272-4835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kristen C. Matter/
Examiner, Art Unit 3771

/Justine R Yu/
Supervisory Patent Examiner, Art Unit 3771